

ASPLENIUM TERRESTRE AND TWO ASPLENIUM HYBRIDS: NEW FERN RECORDS FOR AUSTRALIA

by

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ABSTRACT

The presence of *Asplenium terrestre* Brownsey in the Australian fern flora is recorded for the first time. It occurs in Tasmania and parts of Victoria where it has previously been confused with *A. bulbiferum* Forst. f. and *A. flaccidum* Forst f. A natural hybrid between *A. terrestre* and *A. bulbiferum* is also recorded, and Australian specimens previously referred to *A. scleroprium* Hombr. are thought to belong to another hybrid combination, *A. flaccidum* x *obtusatum* Forst f.

NEW RECORDS

Asplenium terrestre Brownsey, New Zealand J. Bot. 15: 71 (1977)

Asplenium terrestre was first described in a revision of the New Zealand species of *Asplenium* (Brownsey 1977a). Plants belonging to this species were previously included within *A. flaccidum* Forst. f. In New Zealand, *A. terrestre* is an octoploid species which can be distinguished morphologically from the tetraploid *A. flaccidum* by its more highly divided frond and its more prominently ridged spore pattern. It also differs from *A. flaccidum* in growing on the ground and having a more or less erect frond, whereas *A. flaccidum* is commonly epiphytic and has limp, pendulous fronds. In New Zealand, both *A. terrestre* and *A. flaccidum* have two distinct habit-forms, recognised at the subspecific level, which are characteristic of forest and coastal habitats respectively. The distinguishing features of all four taxa are fully described and illustrated in my original paper (Brownsey 1977a).

When first recognising *A. terrestre* as being distinct from *A. flaccidum* I regarded it as a species endemic to New Zealand. However, subsequent investigation of collections in AD, HO, MEL, NSW and WELT, together with some field observations in Tasmania, has shown that *A. terrestre* is also present in the Australian flora in addition to the more widespread *A. flaccidum*.

The plants found in Australia match very closely *A. terrestre* subsp. *terrestre* from New Zealand and can be distinguished from *A. flaccidum* subsp. *flaccidum* by the same morphological characteristics as in the latter region. I have seen no Australian specimens referable to either *A. terrestre* subsp. *maritimum* Brownsey or *A. flaccidum* subsp. *haurakiense* Brownsey which appear to be New Zealand endemics. Unfortunately it has not yet been possible to obtain chromosome counts from plants of Australian *A. terrestre* but the range of mean spore sizes from five Tasmanian populations was found to be $42\text{--}45 \times 28\text{--}31 \mu\text{m}$ which is consistent with New Zealand material. Curiously, the range for four Tasmanian populations of *A. flaccidum* was found to be $42\text{--}48 \times 27\text{--}30 \mu\text{m}$ which is larger than for subsp. *flaccidum* in New Zealand ($36\text{--}44 \times 23\text{--}27 \mu\text{m}$), though within the range for subsp. *haurakiense* ($43\text{--}49 \times 26\text{--}31 \mu\text{m}$). It is obviously desirable that chromosome counts should be obtained from Australian material to confirm that the New Zealand and Australian species are the same.

A. terrestre is confined in Australia to Tasmania, some of the Bass Strait islands and a few localities in southern Victoria. In Tasmania it appears to be more common than *A. flaccidum*, which is restricted to the northern half of the island. Unlike *A. flaccidum* which is normally epiphytic, *A. terrestre* grows on the ground, on damp rock faces, or at the bases of trees. It occurs in wet forest habitats and becomes progressively rarer

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northwards. It has been collected from Flinders Island and Cape Barren Island in Bass Strait, and from Mt. Mueller, Byaduk Caves and the Grampians in Victoria.

In Australia, plants of *A. terrestre* seem to have been confused more frequently with *A. bulbiferum* Forst. f. than with *A. flaccidum*. *Asplenium bulbiferum* and *A. terrestre* often grow in close association but the latter can be distinguished by its thicker, more leathery fronds, by the absence of bulbils and by its longer sori (2-7 mm cf. 2-4 mm).

REPRESENTATIVE SPECIMENS EXAMINED:

Victoria (3/3) — Grampians, Victoria Range, Castle Rock, 6.xi.1966, *A. C. Beauglehole ACB 15883* (MEL 532857); Byaduk Caves, Church Cave, 2.i.1956, *A. C. Beauglehole ACB 42827* (MEL 1502290); Mt. Mueller, nr Mt. Baw Baw, 1889, *J. Melvin* (MEL 99457-8).

Tasmania (4/30) — Cape Barren Is., 28.iv.1967, *J. S. Whinray 480* (MEL 527961); Weldborough, 17.xii.1962, *T. & J. Whaité 2644* (NSW s.n.); Liena to Lorinna Track, W. of Mole Creek, 4.i.1941, *J. Somerville* (HO 243); Betts Falls Track, Mt. Wellington, 3.viii.1981, *P. J. Brownsey* (WELT P11095).

Asplenium bulbiferum x *terrestre*

Hybrids between *A. bulbiferum* and *A. terrestre* have been collected at least twice in Australia and can be recognised by their intermediate morphology and aborted spores. The capacity of related *Asplenium* species to hybridise suggests that this combination is likely to occur wherever the two parent species grow in close proximity.

A. bulbiferum x *terrestre* was not amongst the nineteen different hybrid combinations initially recorded for New Zealand (Brownsey 1977b). However, it has now been found in parts of Canterbury in the South Island.

SPECIMENS EXAMINED:

Victoria (1/1) — Grampians, Victoria Range, Castle Rock, 12.ii.1960, *A. C. Beauglehole ACB 20983* (MEL 532858).

Tasmania (1/1) — Betts Falls Track, Mt. Wellington, 3.viii.1981. *P. J. Brownsey* (WELT P10972-3).

Asplenium flaccidum x *obtusatum*

A. scleroprium Hombr. is a species that occurs only in the New Zealand region where it is confined to coastal areas, often growing alongside *A. obtusatum* Forst. f. on cliffs and in scrub exposed to salt spray (Brownsey 1977a). In Australia it has been recorded from Wilson's Promontory and adjacent islands in Victoria (Ewart 1931; Wakefield 1940; Jones & Clemesha 1981, *ut A. aucklandicum* (Hook. f.) Crookes), but these Victorian records now appear erroneous. I have been able to locate only two Australian collections which in any way resemble New Zealand plants of *A. scleroprium*. Spores from these specimens are all aborted indicating that the plants are almost certainly of hybrid origin. Their morphology suggests that they may be hybrids between *A. flaccidum* and *A. obtusatum*, a combination recorded once in New Zealand from Stewart Island (Brownsey 1977b, fig. 11).

The sterile hybrids, from both New Zealand and Australia, are very similar to *A. scleroprium* and can really only be distinguished by their aborted spores. The similarity is so striking that I postulated that *A. scleroprium* may have arisen in New Zealand as a new allopolyploid species from such sterile hybrids (Brownsey 1977b, fig. 26). If that were the case, there is no reason why the species should not also have arisen independently in Australia. However I have seen no evidence that *A. scleroprium* is present in the latter country.

SPECIMENS EXAMINED:

Victoria (2/2) — Bidy's Camp, Wilson's Promontory, xi.1927, *A. J. Ewart* (MEL 99454); Rabbit Islands, Wilson's Promontory, 5.i.1939, *E. Rossiter* (MEL 99449).

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REFERENCES

- Brownsey, P.J. (1977a). A taxonomic revision of the New Zealand species of *Asplenium*. *New Zealand J. Bot.* 15: 39-86.
- Browsey, P. J. (1977b). *Asplenium* hybrids in the New Zealand flora. *New Zealand J. Bot.* 15: 601-37.
- Ewart, A. J. (1931). 'Flora of Victoria'. (Melbourne University Press).
- Jones, D. L. and Clemesha, S. C. (1981). 'Australian Ferns and Fern Allies'. ed. 2. (Reed: Sydney).
- Wakefield, N. A. (1940). A new Victorian fern record. *Vict. Nat.* 57: 114-116.

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